ICTW 19

19th International Couette-Taylor Workshop
June 24–26, 2015, Cottbus

Useful Information & Programme
19th International Couette-Taylor Workshop

June 24–26, 2015

Local Organizing Committee:
(BTU Cottbus – Senftenberg, Germany)
Contact: ictw19@tu-cottbus.de

- Christoph Egbers
- Rodica Borcia
- Uwe Harlander
- Silke Kaschwich
- Andreas Krebs
- Sebastian Merbold
- Andreas Stöckert

Scientific Committee:

- Dwight Barkley, University of Warwick, UK
- Michael Burin, California State University, USA
- Christoph Egbers, BTU, Cottbus, Germany
- Rainer Hollerbach, University of Leeds, UK
- Hantao Ji, Princeton University, USA
- Daniel Lathrop, University of Maryland, USA
- Patrice Le Gal, IRPHE, CNRS-AIX Marseille, France
- Detlef Lohse, University of Twente, The Netherlands
- Juan Lopez, Arizona State University, USA
- Richard M. Lueptow, Northwestern University, USA
- Francisco Marques, UPC, Barcelona, Spain
- Innocent Mutabazi, LOMC, CNRS-University of Le Havre, France
- Yasushi Takeda, Tokyo Inst. Technology, Japan
- Laurette Tuckermann, PMMH, CNRS-EPSCI, Paris, France

Sponsor:

DFG Deutsche Forschungsgemeinschaft

Co-funded by the German Science Foundation (DFG FOR1182)
### General Schedule

<table>
<thead>
<tr>
<th>Monday, June 22</th>
<th>Tuesday, June 23</th>
<th>Wednesday, June 24</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S1. Taylor-Couette</strong></td>
<td><strong>S6. Taylor-Couette</strong></td>
<td><strong>S10. Taylor-Couette</strong></td>
</tr>
<tr>
<td>09:00–10:30 <strong>Keynote 1</strong></td>
<td>08:30–10:00 <strong>Keynote 3</strong></td>
<td>08:30–10:00 <strong>Keynote 5</strong></td>
</tr>
<tr>
<td><em>D. Lohse</em>: The phase space of</td>
<td></td>
<td><em>R. Hollerbach</em>: Magnetically</td>
</tr>
<tr>
<td>turbulent Taylor-Couette flow</td>
<td></td>
<td>modulated Taylor-Couette flows</td>
</tr>
<tr>
<td>Coffee break</td>
<td>Coffee break</td>
<td>Coffee break</td>
</tr>
<tr>
<td>10:30–11:00</td>
<td>10:00–10:30</td>
<td><strong>&amp; Poster Session</strong></td>
</tr>
<tr>
<td><strong>S2. Taylor-Couette</strong></td>
<td><strong>S7. Taylor-Couette</strong></td>
<td><strong>S11. Taylor-Couette</strong></td>
</tr>
<tr>
<td>11:00–12:15</td>
<td>10:30–12:00</td>
<td>11:15–12:15</td>
</tr>
<tr>
<td>Lunch break</td>
<td>Lunch break</td>
<td>Lunch break</td>
</tr>
<tr>
<td>10:30–11:00</td>
<td>11:00–11:30</td>
<td>11:00–11:30</td>
</tr>
<tr>
<td><strong>S3. Geophysical flows / Waves</strong></td>
<td><strong>S8. Spherical gap flows</strong></td>
<td><strong>S12. Strato-rotating flows</strong></td>
</tr>
<tr>
<td>13:30–15:00 <strong>Keynote 2</strong></td>
<td>13:15–14:45 <strong>Keynote 4</strong></td>
<td>13:15–14:45 <strong>Keynote 6</strong></td>
</tr>
<tr>
<td><em>U. Achatz</em>: Baroclinic waves and</td>
<td><em>D. Lathrop</em>: Waves, turbulence and</td>
<td><em>F. Moisy</em>: What is the energy</td>
</tr>
<tr>
<td>gravity waves in the differentially</td>
<td>magnetic fields in spherical Couette</td>
<td>dissipation rate in rotating</td>
</tr>
<tr>
<td>heated rotating annulus</td>
<td>flow</td>
<td>turbulence?</td>
</tr>
<tr>
<td>Coffee break</td>
<td>Coffee break</td>
<td>Coffee break</td>
</tr>
<tr>
<td>15:00-15:30</td>
<td>14:45–15:15</td>
<td>14:45–15:15</td>
</tr>
<tr>
<td><strong>S4. Taylor-Couette</strong></td>
<td><strong>S9. Spherical gap flows</strong></td>
<td><strong>S13. Strato-rotating flows</strong></td>
</tr>
<tr>
<td>15:30–16:30</td>
<td>15:15–16:30</td>
<td>15:15–16:45</td>
</tr>
<tr>
<td>Coffee break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:30–16:45</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>S5. Couette flows</strong></td>
<td><strong>Guided Tour &amp; Conference Dinner</strong></td>
<td><strong>Closing</strong></td>
</tr>
<tr>
<td>16:45–17:45</td>
<td>17:00–23:00</td>
<td>16:45–17:00</td>
</tr>
<tr>
<td><strong>Lab Tour &amp; Barbecue</strong></td>
<td>Buses start next to conference location</td>
<td></td>
</tr>
<tr>
<td>17:45–22:30</td>
<td>(ZHG) at 17:00</td>
<td></td>
</tr>
</tbody>
</table>
Instructions for Speakers

In the spirit of trouble-free sessions, we kindly request the speakers to transmit a pdf file of their beamer presentation **at least two hours** before the talk to the technical team of the ICTW 19.

The technical team is located close to the registration desk.

The transfer of the file can be done using a USB stick or by writing an email to ictw19@tu-cottbus.de.

Registration Fee and Payment

All participants have to pay the registration fee of 300 Euro. If a participant does not register and does not pay the registration fee, we have to remove the presentation from the scientific program, and cannot publish the abstract.

Online registration is possible until June 14, 2015. Payment information for the online registration:

All payments must be made in Euro. Payments by bank transfer are accepted. Please transfer the conference fee to the following bank account:

- **Account name:** Landeshauptkasse Land Brandenburg / BTU Cottbus-Senftenberg
- **Bank:** Landesbank Hessen Thueringen (Helaba)
- **IBAN:** DE57 3005 0000 7110 402950
- **BIC/SWIFT-Code:** WELAEDDXXX
- **Reason for payment:** Please indicate your first and last name followed by the number 1506600000239 (e.g. Erika Mustermann 1506600000239)

Unfortunately, we are not allowed to accept credit cards due to the regulations of our government. Instead of credit card payment, we kindly request you to pay cash at the onsite registration. An ATM is located in the mensa building (see p. 5).

Participants who did not register until June 14, 2015 must register on-site and pay cash at the registration desk.

Conference Location

The 19th International Couette-Taylor Workshop takes place at the Brandenburg University of Technology, Cottbus, Germany in the **Hörsaal C** of the **ZHG** (Zentrales Hörsaalgebäude) [Lecture Hall C of the Central Auditorium Building].

The **Conference Desk** will be organized in the foyer of this building. It will be open **from 7:45 am to 8:45 am** on all three conference days.
Important Localities on and close to Campus

**Mensa & ATM**

E 14.3264  
N 51.7662

During the three conference days you can have lunch on the upper floor of the mensa. Drinks and smaller dishes like salads, snacks, cakes are available on the ground floor of the mensa and can be consumed there in a coffee shop atmosphere.

The mensa accepts only cash money.

An ATM of the bank Sparkasse is located in mensa building. The entrance door to this ATM is close to the displayed corner of the building.

**Fluidzentrum [Fluid Center]**

E 14.3188  
N 51.7693

In the first evening, we invite you to join us for a tour through the rooms where our experimental facilities are located. Of course, we will present these experiments and we are happy to answer and discuss practical aspects of turbulence measurements. After the lab tour, we have the pleasure to offer you a barbecue next to this site.

Map of Campus
Guided Spreewald Tour & Conference Dinner

On Tuesday, June 23, we invite you for a punt trip in the wonderful universe of water landscape *Spree Forest*. The shuttle buses to the punt haven will start **at 5 pm next to the ZHG** [Central Auditorium Building].
Programme

Monday — June 22, 2015

SESSION 1 — Taylor-Couette flows 9:00 – 10:30 Chair: Bruno Eckhardt

K 1 09:00 DETLEF LOHSE
The phase space of turbulent Taylor-Couette flow

1.1 09:30 SANDER G. HUISMAN
The boiling Twente Taylor-Couette (BTTC) facility: temperature controlled
 turbulent flow between independently rotating cylinders

1.2 09:45 ROELAND C. A. VAN DER VEEN
Multiple states in highly turbulent Taylor-Couette flow

1.3 10:00 RUBEN A. VERSCHOOF
High Reynolds number decay of turbulent Taylor-Couette flow

1.4 10:15 JUAN M. LOPEZ
Precession of a rapidly rotating cylinder flow: traverse through resonance

SESSION 2 — Taylor-Couette flows 11:00 – 12:15 Chair: Chao Sun

2.1 11:00 BRUNO ECKHARDT
Marginally stable and turbulent boundary layers in low-curvature Taylor-
 Couette flow

2.2 11:15 SEBASTIAN MERBOLD
Turbulent Taylor-Couette flow of very wide gaps

2.3 11:30 ANDREAS FROITZHEIM
Wide gap Taylor-Couette flow

2.4 11:45 BORJA MARTÍNEZ-ARIAS
Influence of the radius ratio on the torque in turbulent Taylor-Couette flow

2.5 12:00 JUAN M. LOPEZ
Boundary-layer turbulence and optimal boundary conditions in experiments
of quasi-keplerian flows

SESSION 3 — Geophysical flows / waves 13:30 – 15:00 Chair: Uwe Harlander

K 2 13:30 ULRICH ACHATZ
Baroclinic waves and gravity waves in the differentially heated rotating
annulus.

3.1 14:00 WOLF-GERRIT FRÜH
Spectral features of the transition to Structural Vacillation in the baroclinic
annulus
3.2 14:15  **ANTHONY RANDRIAMAMPIANINA**  
Inertia gravity waves linked to baroclinic waves in a rotating, differentially 
heated annulus with an upper free surface

3.3 14:30  **THOMAS VON LARCHER**  
Multiple scales in the thermally driven rotating annulus: time-series data 
analysis of experiments and numerics

3.4 14:45  **ION DAN BORCIA**  
Inertial wave mode excitation in a liquid bounded by two concentric cylinders

**SESSION 4 — Taylor-Couette flows  15:30 – 16:30  Chair: Francisco Marques**

4.1 15:30  **RICHARD M. LUEPTOW**  
The transition to wavy vortices

4.2 15:45  **JAN ABRSHAGEN**  
Symmetry breaking in Taylor-Couette flow with rotating end plates

4.3 16:00  **ARNAUD PRIGENT**  
Stereo-PIV measurements in the subcritical Taylor-Couette flow

4.4 16:15  **LEA POKORNY**  
Stroboscopic two-dimensional ultrasonic velocity profiling for measuring 
flow transition in Taylor couette systems

**SESSION 5 — Couette flows  16:45 – 17:45  Chair: Masato Nagata**

5.1 16:45  **Takahiro Ishida**  
Numerical investigation of high rotation effects on laminar flow in rotating 
plane Couette flow

5.2 17:00  **Takuya Kawata**  
Experimental Study of Roll-Cell Structure in Laminar Plane Couette Flow 
under System Rotation

5.3 17:15  **Lukasz Klotz**  
New experiments in shears flows with zero mean velocity

5.4 17:30  **Ashley P. Willis**  
Structure in the dynamics of turbulent pipe flow revealed by symmetry 
reduction.
Tuesday — June 23, 2015

SESSION 6 — Taylor-Couette flows     08:30 – 10:00     Chair: Richard M. Lueptow

K 3 08:30  FRIEDRICH H. BUSSE
New Results for the Couette-Taylor System in the Small Gap Limit

6.1 09:00  CHRISTOPHER J. CROWLEY
Experimental observations of direct laminar-turbulent transition in counter-rotating Taylor-Couette flow

6.2 09:15  ROMAN O. GRIGORIEV
Numerical investigation of direct laminar-turbulent transition in counter-rotating Taylor-Couette flow

6.3 09:30  PALOMA GUTIERREZ-CASTILLO
Three-dimensional instabilities of the sidewall boundary layer in a rapidly rotating split cylinder

6.4 09:45  YUICHI MURAI
Reciprocal dominance between toroidal liquid vortices and spiral bubble trajectories in a vertical bubbly Taylor-Couette flow

SESSION 7 — Taylor-Couette flows     10:30 – 12:00     Chair: Gerd Pfister

7.1 10:30  FRANCISCO MARQUES
Complex dynamics of axially localized states in Taylor Couette flows.

7.2 10:45  BRUNO VAN RUYMBEKE
Mechanisms of toroidal - spiral transitions in Taylor-Couette system with spherical bubbles injection

7.3 11:00  CÉLINE GABILLET
Bubbles induced modifications of the Taylor Vortices

7.4 11:15  OLIVIER CRUMEYROLLE
Drag enhancement in subcritical transition to inertio-elastic flows in the Couette-Taylor system

7.5 11:30  SEYED AMIR BAHRANI
Taylor Couette flow of a non-Newtonian fluid: Influence of shear-thinning effects

7.6 11:45  YANG BAI
Viscoelastic instability in differentially rotating Couette-Taylor system: theory and experiment

SESSION 8 — Spherical gap flows     13:15 – 14:45     Chair: Wolf-Gerrit Frühr

K 4 13:15  DANIEL P. LATHROP
Waves, turbulence and magnetic fields in spherical Couette flow
8.1 13:45  SANTIAGO ANDRÉS TRIANA  
Inertial modes driven by differential rotation in a spherical-Couette configuration

8.2 14:00  MICHAEL HOFF  
Experimental study of the fluid flow in a spherical shell induced by librations of the inner sphere: Linear and non-linear features

8.3 14:15  FLORIAN ZAUSINGER  
Convection in the spherical gap with high viscosity contrasts.

8.4 14:30  PHILIPPE BELTRAME  
Onset of intermittent octahedral patterns in spherical Bénard convection

SESSION 9 — Spherical gap flows  
15:15 – 16:30  Chair: Karl Bühler

9.1 15:15  FRED FEUDEL  
Multistability in rotating spherical shell convection

9.2 15:30  ANKIT BARIK  
Flow instabilities in the Spherical Couette System

9.3 15:45  STANISLAV SUBBOTIN  
Inertial waves and flows excited by free inner core in rotating cavity

9.4 16:00  MASATO NAGATA  
Convection in a rotating annulus with radial temperature gradient

9.5 16:15  ROGER KHAYAT  
Microscale thermal convection

Wednesday — June 24, 2015

SESSION 10 — Taylor-Couette flows  
8:30 – 10:00  Chair: Juan M. Lopez

K.5 08:30  RAINER HOLLERBACH  
Magnetically modulated Taylor-Couette flows

10.1 09:00  MARTIN SEILMAYER  
Challenges and recent results of magnetized liquid metal Taylor-Couette experiments

10.2 09:15  MARCUS GELLERT  
Enhanced viscosity and mixing in TC flows influenced by toroidal magnetic fields

10.3 09:30  ALEJANDRO PAREDES  
Mixing of a passive scalar by the instability of a rotating pinch

10.4 09:45  SEBASTIAN ALTMEYER  
Transition to turbulence in Taylor-Couette ferrofluidic flow
<table>
<thead>
<tr>
<th>Session 11 — Taylor-Couette</th>
<th>11:15 – 12:15</th>
<th>Chair: Michael F. Schatz</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>11.1 11:15</strong> <strong>Marcus Schmidt</strong></td>
<td>Investigation of the Taylor-Couette Flow with Cavitation</td>
<td></td>
</tr>
<tr>
<td><strong>11.2 11:30</strong> <strong>Denis Polezhaev</strong></td>
<td>Flows and structures in liquid layer inside a rotating horizontal cylinder</td>
<td></td>
</tr>
<tr>
<td><strong>11.3 11:45</strong> <strong>Yuji Tasaka</strong></td>
<td>Elliptic deformations in rotating free surface flows induced by resonance of waves and quadrupole vortices</td>
<td></td>
</tr>
<tr>
<td><strong>11.4 12:00</strong> <strong>Torsten Seelig</strong></td>
<td>Study of transitional and turbulent flows in rotor/stator cavities</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Session 12 — Strato-rotating flows</th>
<th>13:15 – 14:45</th>
<th>Chair: Patrice Le Gal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>K 6 13:15</strong> <strong>Frederic Moisy</strong></td>
<td>What is the energy dissipation rate in rotating turbulence?</td>
<td></td>
</tr>
<tr>
<td><strong>12.1 13:45</strong> <strong>Marten Klein</strong></td>
<td>DNS of inertial wave attractors in a librating annular cavity with a height-dependent gap</td>
<td></td>
</tr>
<tr>
<td><strong>12.2 14:00</strong> <strong>Abouzar Ghasemi V.</strong></td>
<td>Mean Flow Generation Mechanisms in a Rotating Annular Cavity with Librating Walls</td>
<td></td>
</tr>
<tr>
<td><strong>12.3 14:15</strong> <strong>Colin Leclercq</strong></td>
<td>End-effects versus stratification in quasi-Keplerian Taylor–Couette flow</td>
<td></td>
</tr>
<tr>
<td><strong>12.4 14:30</strong> <strong>Arantxa Alonso</strong></td>
<td>Numerical simulation of the genesis of superhighway convection in a slightly inclined layer of a binary liquid mixture</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Session 13 — Strato-rotating flows</th>
<th>15:15 – 16:45</th>
<th>Chair: Innocent Mutabazi</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>13.1 15:15</strong> <strong>Patrice Le Gal</strong></td>
<td>The Barostrat Instability: combining double-diffusive convection and baroclinic instability in a rotating stratified fluid</td>
<td></td>
</tr>
<tr>
<td><strong>13.2 15:30</strong> <strong>Uwe Harlander</strong></td>
<td>Stratorotational Instability: nonlinear aspects at higher Reynolds numbers</td>
<td></td>
</tr>
<tr>
<td><strong>13.3 15:45</strong> <strong>Junho Park</strong></td>
<td>Stratorotational and centrifugal instabilities of the Couette-Taylor flow</td>
<td></td>
</tr>
<tr>
<td><strong>13.4 16:00</strong> <strong>Nathanaël Machicoane</strong></td>
<td>Influence of the multipolar order of the source on the viscous decay of inertial waves</td>
<td></td>
</tr>
<tr>
<td><strong>13.5 16:15</strong> <strong>Antoine Meyer</strong></td>
<td>Effect of the centrifugal buoyancy on the stability of Taylor-Couette flow</td>
<td></td>
</tr>
</tbody>
</table>
13.6 16:30 Harunori N. Yoshikawa
Wave generation in a circular Couette flow in thermoelectric radial buoyancy

Poster Session 10:00 – 11:15

P.1 Flow inversion in small-aspect-ratio counterrotating Taylor-Couette flow
P.2 Streamwise-Localized Solutions with natural 1-fold symmetry
P.3 Spatial distribution and motion of finite-sized particles in turbulent Taylor-Couette flow
P.4 Swirl boundary layer and flow separation at the inlet of a rotating pipe
P.5 The gravity effect on the Taylor-Dean Flow between two horizontal rotating coaxial cones
P.6 Effect of the Working Fluid on the Onset of Taylor Vortices in a Cylindrical Annulus: Analyze and Comparison Between Different Liquids
P.7 Modeling rotating flows in narrow gaps — Approach towards a general clearance-averaged pressure model
P.8 Absolute and convective instabilities in eccentric Taylor-Couette–Poiseuille flow
P.9 Experimental Investigations of Two Immiscible Fluids and Free Surface Effects in Cylindrical Taylor-Couette Flow
P.10 Hydrodynamic Instability of Liquid Metal Flow in Conical Taylor-Couette System
P.11 The generalized Onsager model for a binary gas mixture with swirling feed
P.12 Harmonic and subharmonic instabilities on modulated Taylor-Couette flow in the limit of low frequency
P.13 Effect of perturbation on turbulence in a gradual expansion pipe flow
P.14 Experimental investigation on the rheology of Non-Brownian dense suspensions
P.15 Effect of the Free Surface in Tilted Conical Taylor-Couette Flow System
P.16 An applied Couette-Taylor system as a simplified bearing model.